

CLAIMS:

1. A light source (1) with a discharge vessel (2) which is filled with a filling gas, and with an electron beam source (4) arranged in vacuum or in a region of low pressure, which source (4) generates electrons (12) and propels them through an inlet foil (8) into the discharge vessel (2), characterized in that the inlet foil (8) comprises a diamond layer.

2. A light source as claimed in claim 1, characterized in that the diamond layer has a thickness below 100 μm , in particular below 50 μm , advantageously below 20 μm .

3. A light source as claimed in claim 1 and/or 2, characterized in that the diamond layer has a frame (7).

4. A light source as claimed in claim 1 and/or 2, characterized in that the diamond layer has a metal brazing layer.

5. A light source as claimed in claim 1 and/or 2, characterized in that the diamond layer has an organic adhesion layer.

6. A light source as claimed in claim 1, characterized in that the electron beam source comprises a thermionic electron emitter.

7. A light source as claimed in claim 1, characterized in that the electron beam source comprises a field emitter.

8. A method of manufacturing a foil (8) for a light source (1), characterized by the following process steps:

- carbon atoms are deposited on a substrate (7) so as to form a diamond foil (8), and
- a portion of the substrate is etched away such that a remaining portion (7) of the substrate forms a frame (7) for the diamond foil (8).

9. A method of manufacturing a foil (8) for a light source (1), characterized by the following process steps:

- carbon atoms are deposited on a substrate so as to form a diamond foil (8),
- the diamond foil (8) is removed from the substrate, and
- 5 - the diamond foil (8) is brazed to a frame (7).

10. A method of manufacturing a foil (8) for a light source (1), characterized by the following process steps:

- carbon atoms are deposited on a substrate so as to form a diamond foil (8),
- 10 - the diamond foil (8) is removed from the substrate (7), and
- the diamond foil (8) is adhered to a frame (7).